UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,586	10/23/2000	Timothy Roy Block	IBM/ 167	8940

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EXAMINER
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ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.		Applicant(s)
Office Action Summary	09/694,586		BLOCK ET AL.
	Examiner		Art Unit
	Benjamin R Bruckart		2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _03 May 2004_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-31_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-31_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

Status of Claims:

Claims 1-31 are pending in this Office Action.

Claims 1-31 remain rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent

No. 6,108,699 by Moiin.

Response to Arguments

Applicant's arguments filed in the amendment filed May 3, 2004, Paper No. 3, have been

fully considered but they are not persuasive. The reasons are set forth below.

Applicant's invention as claimed:

Claims 1-31 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No.

6,108,699 by Moiin.

Regarding claim 1, a method of dynamically modifying a cluster communication parameter in a clustered
computer system (Moiin: col. 2, lines 10-20; col. 14, lines 2-15), the method comprising:

(a) initiating a cluster (Moiin: col. 2, lines 16-20), communication parameter modification by transmitting a
message to a plurality of nodes in the clustered computer system (Moiin: col. 2, lines 16-20);

(b) locally confirming, within each node, receipt of the message by each of the plurality of nodes (Moiin:
col. 2, lines 32-35);

(c) in response to confirming receipt of the message by each of the plurality of nodes, invoking a local
cluster communication parameter modification operation on each node (Moiin: col. 2, lines 34-37; col. 14, lines 10-
15; transition thread);

(d) transmitting from each node a status of the local cluster communication parameter modification invoked
on that node (Moiin: col. 2, lines 44-50);

(e) locally detecting, within each node, an unsuccessful status for the local cluster communication
parameter modification on any node (Moiin: col. 2, lines 39-44); and

(f) in response to detecting an unsuccessful status for any node, locally undoing, in each node for which the local cluster communication operation was performed, the local cluster communication parameter modification operation performed on that node (Moiin: col. 2, lines 50-55).

Regarding claim 2, the method of claim 1, wherein the cluster communication parameter comprises a heartbeat parameter (Moiin: col. 14, lines 26-34).

Regarding claim 3, the method of claim 1, wherein the cluster communication parameter is selected from the group consisting of heartbeat message time out, heartbeat acknowledgment message time out, heartbeat frequency or interval, heartbeat failure threshold, heartbeat acknowledgment failure threshold, receive/send timer ratio,   maximum fragment size, message retry timer value, maximum message retry time, send queue overflow threshold, message send window size, and combinations thereof (Moiin: col. 13, 60- col. 14, line 34).

Regarding claim 4, the method of claim 1, wherein locally confirming receipt of the message by each of the plurality of nodes includes participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 44-50).

Regarding claim 5, the method of claim 1, wherein transmitting from each node a status of the local cluster communication parameter modification invoked on that node is performed during an ACK round performed subsequent to invoking the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55).

Regarding claim 6, the method of claim 1, wherein transmitting the message, confirming receipt of the message, and transmitting the status are performed via multicast messages (Moiin: col. 2, lines 39-55; multicast is broadcasting to multiple addresses).

Regarding claim 7, an apparatus (Moiin: col. 4, lines 25-32), comprising:
        (a) a memory (Moiin: col. 4, line 26); and
        (b) a program resident in the memory (Moiin: col. 4, lines 15-18), the program configured to dynamically modify a cluster communication parameter on a local node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), the program configured to locally confirm, for the local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), the program further configured to undo a local cluster communication parameter modification operation performed on the local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55).

Regarding claim 8, the apparatus of claim 7, wherein the program is further configured to locally confirm receipt of an initiating message by each of the plurality of nodes (Moiin: col. 2, lines 44-50; col. 2, 32-34; Figure 4, tag 406).

Regarding claim 9, the apparatus of claim 8, wherein the program is configured to locally confirm receipt of the initiating message by each of the plurality of nodes by participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 44-50; Figure 4, tag 406).

Regarding claim 10, the apparatus of claim 7, wherein the program is further configured to transmit from the local node a status of the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55; status of success or failure dependent on response).

Regarding claim 11, the apparatus of claim 10, wherein the program is configured to transmit the status during an ACK round performed subsequent to invocation of the local cluster communication parameter modification operation (Moiin: col. 2, lines 32-34, lines 44-50).

Regarding claim 12, a clustered computer system (Moiin: col. 2, lines 10-16), comprising:

(a) a plurality of nodes coupled to one another over a network (Moiin: col. 3, lines 64- col. 4, line 1; Figure 1); and

(b) a plurality of programs (Moiin: col. 4, lines 15-18), each local to a node among the plurality of nodes (Moiin: col. 4, lines 13-18), each program configured to dynamically modify a cluster communication parameter on its respective local node (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), each program further configured to locally confirm, for its respective local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), and each program further configured to undo a local cluster communication parameter modification operation performed on its respective local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55).

Regarding claim 13, a program product (Moiin: col. 4, lines 25-32), comprising:

(a) a program configured to dynamically modify a cluster communication parameter on a local node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), the program configured to locally confirm, for the local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), the program further configured to

undo a local cluster communication parameter modification operation performed on the local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55); and

(b) a signal bearing medium bearing the program (Moiin: col. 4, lines 58-66).

Regarding claim 14, the program product of claim 13, wherein the signal bearing medium includes at least one of a transmission medium and a recordable medium (Moiin: col. 5, lines 9-17; col. 4, lines 28-32).

Regarding claim 15, the program product of claim 13, wherein the program is further configured to locally confirm receipt of an initiating message by each of the plurality of nodes (Moiin: col. 2, lines 32-35).

Regarding claim 16, the program product of claim 15, wherein the program is configured to locally confirm receipt of the initiating message by each of the plurality of nodes by participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 32-35, lines 44-50; Figure 4, tag 406).

Regarding claim 17, the program product of claim 13, wherein the program is further configured to transmit from the local node a status of the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55).

Regarding claim 18, the program product of claim 17, wherein the program is configured to transmit the status during an ACK round performed subsequent to invocation of the local cluster communication parameter modification operation (Moiin: col. 2, lines 32-35, lines 39-55).

Regarding claim 19, a method of dynamically modifying a heartbeat parameter in a node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15, lines 26-34), the plurality of nodes including first and second nodes (Moiin: Figure 1), the first node configured to send a heartbeat message to the second node (Moiin: col. 2, lines 16-20), and the second node configured to send an acknowledgment message to the first node in response to receiving the heartbeat message (Moiin: col. 2, lines 29-34), the method comprising:

(a) sending a heartbeat message from the first node to the second node, the heartbeat message indicating that a heartbeat parameter is to be modified (Moiin: col. 14, lines 26-34, lines 10-15); and

(b) deferring modification of the heartbeat parameter in the first node until receipt of an acknowledgment message sent from the second node to the   first node that indicates that the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 34-44, lines 50-55; col. 7, lines 31-61).

Regarding claim 20, the method of claim 19, further comprising determining whether modifying the heartbeat parameter on the first node requires synchronization with the second node (Moiin: col. 14, lines 10-15, lines 26-34, Figures 4, 5, and 6; col. 2, lines 29-37).

Regarding claim 21, the method of claim 20, wherein determining whether modifying the heartbeat parameter on the first node requires synchronization with the second node further comprises determining whether the heartbeat parameter is local or global in nature (Moiin: col. 14, lines 19-21; col. 5, lines 18-30).

Regarding claim 22, the method of claim 19, further comprising, in response to receiving the heartbeat message with the second node, sending an acknowledgment message from the second node to the first node, the acknowledgment message indicating whether the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 32-34, lines 44-55; col. 7, lines 53-61).

Regarding claim 23, the method of claim 22, wherein each of sending the heartbeat message and sending the heartbeat acknowledgment message includes accessing a heartbeat message record that includes a change request indicator (Moiin: col. 6, lines 35-42; cluster size field change sets the flag to Figure 4 events), the method further comprising:

(a) prior to sending the heartbeat message that indicates that the heartbeat parameter is to be modified, setting the change request indicator in the heartbeat message record (Moiin: col. 6, lines 13-19, lines 35-52; col. 7, lines 31-40, 53-61), and

(b) prior to sending the heartbeat acknowledgment message that indicates whether the heartbeat parameter has been modified in the second node, selectively setting or clearing the change request indicator in the heartbeat message record (Moiin: col. 6, lines 13-19, lines 35-52; col. 7, lines 31-40, 53-61).

Regarding claim 24, the method of claim 23, wherein deferring modification of the heartbeat parameter in the first node until the acknowledgment message indicates that the heartbeat parameter has been modified in the second node includes modifying the heartbeat parameter in the first node only after receiving a heartbeat acknowledgment message with a set change request indicator (Moiin: col. 7, lines 31-61).

Regarding claim 25, the method of claim 19, further comprising:

(a) modifying the heartbeat parameter in the second node (Moiin: col. 2, lines 32-38; col. 14, lines 10-15); and

(b) modifying the heartbeat parameter in the first node after receipt of an acknowledgment message sent from the second node to the first node that indicates that the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 44-54; col. 14, lines 10-15).

Regarding claim 26, an apparatus (Moiin: col. 4, lines 25-32), comprising:

(a) a memory (Moiin: col. 4, line 26); and

(b) a program resident in the memory (Moiin: col. 4, lines 15-18) and configured to dynamically modify a heartbeat parameter in a first node among a plurality of nodes in a clustered computer system by sending a heartbeat message to a second node among the plurality of nodes that indicates that the heartbeat parameter is to be modified (Moiin: col. 2, lines 16-20; col. 14, lines 2-15) and thereafter deferring modification of the heartbeat parameter in the first node only after receiving an acknowledgment message from the second node indicating that the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 44-54; col. 14, lines 10-15).

Regarding claim 27, the apparatus of claim 26, wherein the program is further configured to determine whether modifying the heartbeat parameter on the first node requires synchronization with the second node (Moiin: col. 14, lines 10-15, lines 26-34, Figures 4, 5, and 6).

Regarding claim 28, the apparatus of claim 27, wherein the program is configured to determine whether modifying the heartbeat parameter on the first node requires synchronization with the second node by determining whether the heartbeat parameter is local or global in nature (Moiin: col. 14, lines 19-21; col. 5, lines 18-30).

Regarding claim 29, the apparatus of claim 26, wherein the program is configured to send the heartbeat message by accessing a heartbeat message record that includes a change request indicator (Moiin: col. 6, lines 35-42), and wherein the program is further configured to set the change request indicator in the heartbeat message record prior to sending the heartbeat message that indicates that the heartbeat parameter is to be modified (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61).

Regarding claim 30, the apparatus of claim 29, wherein the program is configured to defer modification of the heartbeat parameter in the first node until the acknowledgment message indicates that the heartbeat parameter has been modified in the second node by modifying the heartbeat parameter in the first node only after receiving a heartbeat acknowledgment message with a set change request indicator (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61).

Regarding claim 31, a program product (Moiin: col. 4, lines 25-32), comprising:

(a) a program configured to dynamically modify a heartbeat parameter in a first node among a plurality of nodes in a clustered computer system by sending a heartbeat message to a second node among the plurality of nodes that indicates that the heartbeat parameter is to be modified (Moiin: col. 2, lines 16-20; col. 14, lines 2-15) and thereafter deferring modification of the heartbeat parameter in the first node only after receiving an acknowledgment message from the second node indicating that the heartbeat parameter has been modified in the second node (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61); and

(b) a signal bearing medium bearing the program (Moiin: col. 4, lines 58-66).

The Applicant Argues:

With respect to claim 1, applicant argues Moiin does not teach "a method of dynamically modifying a cluster communication parameter."

In response, the examiner respectfully submits:

The cited portion lies in the preamble of the claim. In response to applicant's arguments, the recitation has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The Moiin reference does teach modifying the cluster communication parameter. Moiin teaches the cluster communication system and how it communicates to determine and update membership: joining and connected and leaving (Moiin: col. 2, lines 10-20, 39-55). Moiin teaches cluster communication parameters in col. 14, lines 26-34, which are low level (kernel) communication parameters that control how the nodes operates in the current clustered computer system (line 34). The applicant agrees with examiner's assessment that Moiin teaches dynamically modifying cluster membership. Moiin teaches the parameters are implemented in the kernel and CMM (cluster membership model) and therefore by changing membership of the cluster, changing or modifying parameters of communication is also done. Applicant cites the specification in his arguments, although the claims are interpreted in light of the specification,

limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

With regards to claim 1, point [c], the Moiin reference does teach invoking a local cluster communications parameter modification operation on each node (Moiin: col. 2, lines 34-37; col. 14, lines 10-15) to update the membership of the cluster the node is active in. If the membership is altered, so are the parameters in which membership is established. Arguments for claims 7, 12, 13 are directed to this explanation.

With respect to claim 2, applicant argues Moiin does not teach "making any changes to any parameter associated with such heartbeat messages."

In response, the examiner respectfully submits:

The cited portion (col. 14, lines 26-34) teaches Moiin's use of heartbeat and other threads of the cluster membership monitor program to operate and indicate to the node of the cluster. The Moiin reference teaches dynamically modifying cluster membership through the use of the cited parameter portions. By modifying the cluster membership, you will be altering the parameters to the nodes you send and receive.

With respect to claim 3, applicant argues Moiin does not teach, "dynamically modifying the cited list of parameters."

In response, the examiner respectfully submits:

As argued in claim 1, the cited portion of claim 3, is addressed in col. 14, lines 26-34 citing many of the same or similar parameters embedded in the kernel of the operating system of

the node or the CMM. These parameters are used in conjunction with the current cluster

membership. If the membership is altered, so are the parameters in which membership is

established.

With respect to claim 19, applicant argues Moiin does not teach "a method of

dynamically modifying a heartbeat parameter in a node among a plurality of nodes."

In response, the examiner respectfully submits:

The cited portion lies in the preamble of the claim. See argument for claim 1. The

modification of the heartbeat parameter is done in light of the modification of the membership of

the cluster. Claims 26 and 31 are dependent upon the argument presented to traverse claim 19

and are argued in the same sense as above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Benjamin R Bruckart whose telephone number is (703) 305-

0324. The examiner can normally be reached on 8:00-5:30PM with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hosain Alam can be reached on (703) 308-6662. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Benjamin R Bruckart
Examiner
Art Unit 2155

brb
June 1, 2004

HOSAIN ALAM
SUPERVISORY PATENT EXAMINER